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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,182	12/20/2006	Bennett M. Butters	385478008US2	3490
25996	7590	03/13/2008		
PERKINS COIE LLP			EXAMINER	
PATENT-SEA			WHITTINGTON, KENNETH	
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			ART UNIT	PAPER NUMBER
			2862	
			MAIL DATE	DELIVERY MODE
			03/13/2008 PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/575,182

**Applicant(s)**

BUTTERS ET AL.

**Examiner**

KENNETH J. WHITTINGTON

**Art Unit**

2862

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 45-48, 57 and 61-68 is/are pending in the application.
- 4a) Of the above claim(s) 64-68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 45-48, 57 and 61-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/20/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election without traverse of Group III, claims 45-48 and 57-60 in the reply filed on February 12, 2008 is acknowledged.

However, in view of the amendment to the claims and the newly added claims, restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 45-48, 57 and 61-63, drawn to computer medium for controlling and a an apparatus comprising a SQUID apparatus having a SQUID, a second order gradiometer and an electromagnetic shielding external the cryogenic container, classified in class 324, subclass 248.
- II. Claims 64-68, drawn to an apparatus and method for interrogating a sample using a gradiometer and superconductive shielding an generating a spectral plot in a selected frequency range of between at least 100 and 50kHz, classified in class 324, subclass 228 or 244.

The inventions are distinct, each from the other because of the following reasons:

Inventions in Groups I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination in Group I has separate utility such as not requiring the generation of spectral plots in the frequency range of 100 and 50KHz. Furthermore, the subcombination in Group II has a separate utility as not requiring a SQUID circuit or any cryogenic sensing apparatus. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction

requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must

be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Newly submitted claims 64-67 are directed to an invention that is independent or distinct from the invention that was elected for examination in the response filed February 12, 2008. Since applicant has explicitly elected this invention in Group I (now claims 45-48, 57 and 61-63), this invention will be examined. Accordingly, claims 64-67 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 45-48, 57 and 61-63 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention. Claims 45 and 57 require a superconducting shielding that was not disclosed in the specification as filed. This feature was added in the amendment filed in response to the restriction requirement mailed January 14, 2008.

At most, the specification and drawings of this application as well as the parent applications disclose a magnetic or electromagnetic shielding surrounding the sample and/or the Dewar for superconducting components, these shields comprising a faraday cage for blocking electric fields or sheets of permalloy or lead for blocking magnetic fields. Nowhere is there a disclosure of superconducting shields or how they operate. Accordingly, now claiming the shields as such is new matter to the application and claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an



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application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 45-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Wellstood et al. (US6516281), hereinafter Wellstood. Regarding these claims, it is noted that the claims are written as intended use claims. The claims recite a computer-readable medium, but do not provide any further limitation of this medium.

For instance, claim 45 recites that this medium has contents to cause a processing device to perform a method, but does not recite what these contents are. The dependent claims simply provide further limitation on this method, but not on the medium. Accordingly, since these apparatus claims directed to a computer-readable medium with contents, any computer-readable medium with contents thereon will suffice to read on these claims.

Therefore, Wellstood discloses the features claims 45-48 because Wellstood discloses a computer readable medium having contents thereon (See Wellstood claim 19).

Claims 57 is rejected under 35 U.S.C. 102(b) as being anticipated by Ohta et al. (US5339811), hereinafter Ohta. Regarding claim 57, Ohta discloses an apparatus comprising:

means for detecting electromagnetic emission signals positioned near to the sample, wherein the means for detecting include a second derivative detector (See FIG. 1, item 6 and col. 3, line 50 to col. 4, line 4 and col. 4, lines 39-58);

a Super Conducting Quantum Interference Device electrically connected to the means for detecting, wherein the Super Conducting Quantum Interference Device is positioned within a means for cryogenically cooling (See FIG. 1, item 6, col. 3, lines 34-49, and col. 5, line 58 to col. 6, line 24);

means for electromagnetically shielding at least a portion of the sample, the means for detecting, and the Super Conducting Quantum Interference Device, wherein the means for electromagnetically shielding includes means for superconductively shielding, and wherein the means for electromagnetically shielding is positioned exterior to the means for cryogenically cooling (See FIG. 1, items 1 and 4);

means for aligning electromagnetic fields within the system (See FIG. 1, note structures shown for aligning fields);

means for controlling the Super Conducting Quantum Interference Device (See entire disclosure, note there would be

some control apparatus for maintaining temperatures of the Dewar, and receiving signals to make measurements therefrom); and

means for outputting the electromagnetic emissions (See col. 5, line 58 to col. 6, line 24, note there would be some output from the SQUID flux meters).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

It is initially noted that the use of a second order gradiometer was not present in the original application (App. 10/112,927), but was added to the later application (App. 10/683875) filed on October 3, 2003. Thus, this date will be the invention date for purposes of examination.

Claims 45, 46, 48, 57, 62 and 63 (it is assumed the method steps are positively recited limitations in claims 45-48) are rejected under 35 U.S.C. 103(a) as being unpatentable over

Clarke et al. (US6885192), hereinafter Clarke, in view of Hayashi et al. (US5113136), hereinafter Hayashi and Ohta.

Regarding claim 45, Clarke teaches computer-readable medium (See Clarke FIG. 4, item 45, note that a computer would necessarily have a recordable medium with contents to control its and periphery applications) whose contents control at least one data processing device to perform a method to display data representing a signal from a sample, the method comprising:

receiving a sample signal that has been produced by applying a generated stimulus signal to a sample within an magnetically shielded detection apparatus in the absence of another generated signal from another signal source, wherein the electromagnetically shielded detection apparatus includes superconductive shielding, wherein a combination of the stimulus signal with an electromagnetic signal emitted by the sample takes on a different characteristic than the stimulus signal through stochastic resonance, and wherein the electromagnetically shielded detection apparatus includes therein a Super Conducting Quantum Interference Device electrically connected to at least one electromagnetic emission detection coil detector, wherein the detector includes a gradiometer, and wherein the electromagnetically shielded detection apparatus is configured to align electromagnetic

fields within the detection apparatus (See FIGS. 2 and 3, note SQUID apparatus comprising SQUID 31, detection gradiometer for SQUID 15, stimulus field generators 16 and 17, superconductive shield 19, magnetic shield 20),

wherein the sample acts as a signal source for molecular signals (See sample cell 12), and wherein the electromagnetically shielded detection apparatus includes a cryogenic container and magnetic shielding external to the cryogenic container, wherein the stimulus signal is applied to the sample within-in the absence of another generated signal from another signal source, and wherein the sample is not ionized or damaged during the receiving of the sample signal (See FIGS. 3 and 4, note magnetic shield 20, field sources 16 and 17, note sample is not destroyed);

processing the sample signal to analyze characteristics of the sample signal (See FIG. 4, note circuit for signal processing); and

outputting the sample signal, wherein the sample signal is represented as a series of peaks at select frequencies, wherein the peaks are substantially greater than other peaks in the sample signal, and wherein at least some of the other peaks represent the stimulus signal (See FIG. 4, note computer 45 for

performing operations would have some display and see FIGS. 6-8 for peaks in signals).

However, Clarke does not teach the shielding including electromagnetic shielding or the use of a second order gradiometer.

Hayashi teaches using a second-order gradiometer in lieu of a first order gradiometer (See Hayashi col. 2, line 63 to col. 3, line 4). It would have been obvious at the time the invention was made to use a second-order gradiometer in lieu of the first order gradiometer in the apparatus of Clarke. One having ordinary skill in the art would do so to remove a uniform gradient magnetic field (See Hayashi col. 2, line 63 to col. 3, line 4).

Ohta teaches placing a SQUID detection apparatus into an electromagnetically shielded room (See Ohta col. 3, lines 64-67). It would have been obvious at the time the invention was made to place the apparatus of Clarke into an electromagnetically shielded room to provide the apparatus with electromagnetic shielding. One having ordinary skill in the art would do so to provide shielding to the apparatus of Clarke from spurious or environmental electromagnetic radiation.

Regarding claim 46, this combination teaches the method further comprising displaying, via a graphical user interface,

the sample signal, wherein the sample signal is displayed as a series of peaks at the select frequencies (See Clarke FIGS. 4 and 6-8, note computers typically have a GUI and see images shown).

Regarding claim 48, this combination teaches the processing of the sample signal includes applying a linear mathematical process to the sample signal (See FIGS. 3 and 4, item 43 which is an integrator for the signal and see also amplifier 44).

Regarding claim 57, Clarke teaches an apparatus comprising:  
means for detecting electromagnetic emission signals positioned near to the sample, wherein the means for detecting include a second derivative detector (See FIGS. 3 and 4, item 15);

a Super Conducting Quantum Interference Device electrically connected to the means for detecting, wherein the Super Conducting Quantum Interference Device is positioned within a means for cryogenically cooling (See FIGS. 3 and 4, item 30);

means for magnetically shielding at least a portion of the sample, the means for detecting, and the Super Conducting Quantum Interference Device, wherein the means for magnetically shielding includes means for superconductively shielding, and wherein the means for magnetically shielding is positioned

exterior to the means for cryogenically cooling (See FIGS. 3 and 4, items 19 and 20);

means for aligning electromagnetic fields within the system (See FIGS. 3 and 4, note structures shown for aligning fields);

means for controlling the Super Conducting Quantum Interference Device (See circuit shown in FIG. 4); and

means for outputting the electromagnetic emissions (See FIG. 4, item 45 and see FIGS. 6-8).

However, Clarke does not teach the shielding including electromagnetic shielding or the use of a second order gradiometer.

Hayashi teaches using a second-order gradiometer in lieu of a first order gradiometer (See Hayashi col. 2, line 63 to col. 3, line 4). It would have been obvious at the time the invention was made to use a second-order gradiometer in lieu of the first order gradiometer in the apparatus of Clarke. One having ordinary skill in the art would do so to remove a uniform gradient magnetic field (See Hayashi col. 2, line 63 to col. 3, line 4).

Ohta teaches placing a SQUID detection apparatus into an electromagnetically shielded room (See Ohta col. 3, lines 64-67). It would have been obvious at the time the invention was made to place the apparatus of Clarke into an



electromagnetically shielded room to provide the apparatus with electromagnetic shielding. One having ordinary skill in the art would do so to provide shielding to the apparatus of Clarke from spurious or environmental electromagnetic radiation.

Regarding claim 62, this combination teaches means for automatically and vertically positioning the signal source within the apparatus (Note signal source is undefined in the claims, thus the sample providing a signal to the gradiometer will be interpreted as this signal source. See Clarke FIGS. 3 and 4, note sample is lowered into the apparatus where it is automatically vertically positioned in the bottom of the tail section 14).

Regarding claim 63, this combination teaches the superconducting shielding comprising superconducting lead shielding that at least partially encloses the signal source and means for detecting (See Clarke FIGS. 3 and 4, note item 19).

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke in view of Ohta and Hayashi as applied to claim 45 above, and further in view of Schlosser et al. (US5696691), hereinafter Schlosser. Regarding this claim, the noted combination teaches the features noted above and further performing some sort of transform of the sample signal to create

the frequency graphs shown in FIGS. 6-8 of Clarke, but not a Fast Fourier Transform. Schlosser teaches using a Fast Fourier Transform on a received signal (See Schlosser col. 2, lines 9-31). It would have been obvious at the time the invention was made to perform a Fast Fourier Transform on the sample signal in the apparatus of the noted combination. One having ordinary skill in the art would do so to convert the signal from the time domain to the frequency domain and to excise harmonics that might dominate the frequency band (See Schlosser col. 2, lines 9-31).

Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke in view of Ohta and Hayashi as applied to claim 57 above, and further in view of Krause et al. (US5506500), hereinafter Krause. Regarding this claim, the noted combination teaches a tube for receiving the signal source therein, but not the material therein. Krause teaches a magnetic detecting assembly inside a cryogenic Dewar comprising a stainless steel tube into which a sample is placed during magnetic testing of the sample (See Krause FIG. 5, item 146). It would have been obvious at the time the invention was made to make the tube structures of Clarke out of stainless steel. One having ordinary skill in the art would do so to make the sample

isothermal and thermally isolated from the cryogenic tank (See Krause col. 9, lines 32-65). It is also noted that a property of stainless steel tubing is that it provides at least 2kHz of low pass filtering.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH J. WHITTINGTON whose telephone number is (571)272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Kenneth J Whittington/  
Primary Examiner, Art Unit 2862